

INSTALLATION, OPERATION & MAINTENANCE MANUAL



**CONCEALED CHILLED WATER VERTICAL FAN COIL UNITS
'VWL' SERIES**

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*CONTINUING RESEARCH RESULTS IN STEADY IMPROVEMENTS.
THEREFORE, THESE SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.*

MODEL DECODING

1, 2 & 3 BASIC(SERIES)	4 & 5 SIZE (x 100 CFM)	6 ELECTRICAL SUPPLY (V-Ph-Hz)	7 COIL	8 HEATER	9 ACCESSORIES	10 FIN	11 COIL CONNECTION	12 FILTER	13 OPTION
VWL COOLINE CONCEALED CHILLED WATER FAN COIL UNIT, VERTICAL SERIES	03	B:220/240-1-50	A : 3 ROW CHILLED WATER J : 3 ROW CHILLED WATER + 1 ROW HEAT	N : NO HEATER	N : STANDARD B : 3D VALVE PACKAGE (COOL ONLY) K : 4D VALVE PACKAGE (HEAT & COOL)	A : ALUMINUM FIN B : COATED ALUMINUM FIN C : COPPER FIN	R : RH SIDE, STANDARD (FACING AIR DISCHARGE) L : LH SIDE, OPTIONAL (FACING AIR DISCHARGE)	N : NONE A : ALUMINUM (1" THICK)	N : STANDARD UNIT
	04			E : 3 kW F : 4 kW					
	06			N : NO HEATER					
	08			G : 5 kW H : 6 kW					
	10			J : 7 kW					

OPTIONS

ELECTRICAL HEATERS

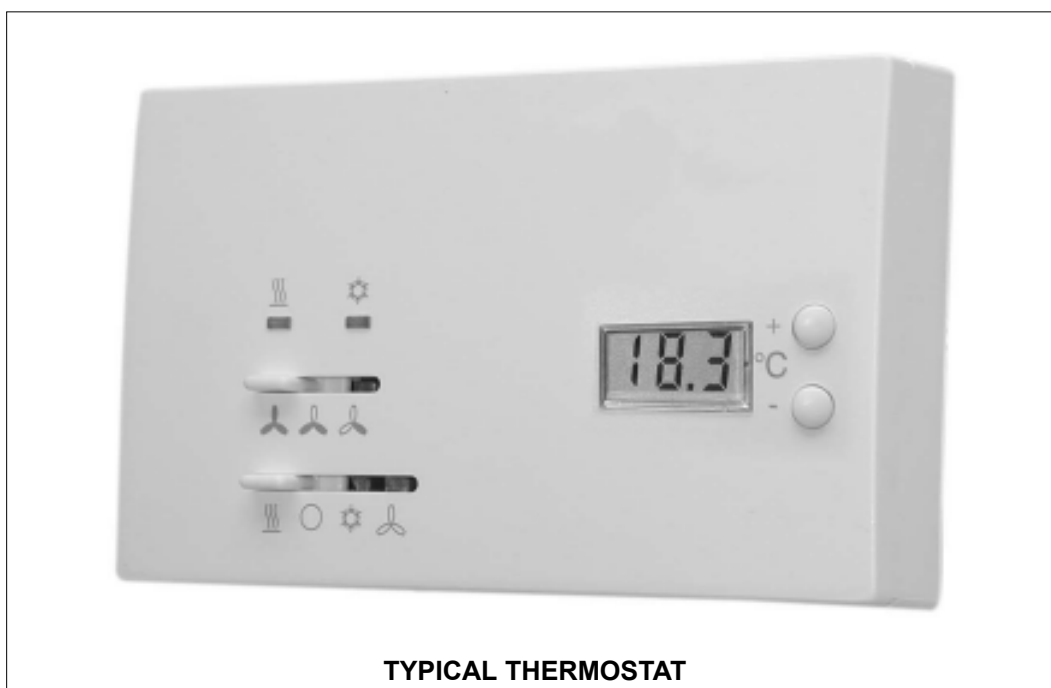
The heating element is made of tubular finned sheath coil of the highest grade resistance wire precisely centered in a 1/2" dia. Copper plated steel sheath and insulated from the sheath by magnesium oxide powder. Through the application of mechanical force, the powder is packed to a rock like density, insuring rapid heat dissipation from the resistance coil to the sheath section at each end of the element is unheated to remove source of heat from the terminals. The surface area exposed to the air is increased by the application of 1-1/4" OD fins. The fin is made of steel wound around the element in a continuous spiral which makes five turns per linear inch of element. The sheath and fin are permanently bonded together by copper brazing.

VALVE PACKAGES

Valve packages, as a set are available as an option (3D for two-pipe system and 4D for four-pipe system). These valves are supplied loose for field installation.

THERMOSTAT

An attractive wall mount three speed thermostat with all required functions and features for safe and smooth operation which can be used for cooling & heating. This thermostat can be supplied loose through separate Kit number.



GENERAL INFORMATION

Thank you for your purchase of this equipment from the COOLINE Air Conditioners. We trust that this unit will provide you with the proper Cooling/Heating requirements for years to come.

This unit has been tested to the extremes in terms of working conditions and successfully passed all the requirements of quality, safety and performance.

However, we would suggest that you read carefully this manual before you proceed with the installation and operation of this equipment and follow the instructions for a safe, trouble free operation.

WARRANTY TERMS

All of the VWL series of indoor vertical fan coil (concealed) units are covered by the standard warranty terms against any manufacturer defect. Should you encounter any problem that falls under the warranty terms please contact your nearest COOLINE representative.

INSPECTION PROCEDURES

The moment you receive this unit, check the packaging carton for any visible damage due to shipment and mishandling. If you suspect any damage to the unit please call your nearest COOLINE representative.

After you open the carton, make sure that there is no visible damage to the body. Check the condition of the protective Styrofoam. Manually rotate the blower wheels to make sure that it is running freely.

NOTE: Any damage, visible or concealed should be reported immediately to the delivery man or driver and noted on the shipping invoice.

Inside every VWL packaging you will find:

- VWL Concealed FCU 1 No
- Service Manual 1 No

SAFETY ISSUES

When performing any task pertaining to the installation and servicing of the unit, the skilled technician should observe the following safety measures:



WARNING:

Electric shock hazard and / or serious injury from rotating parts can result from improper handling and servicing. Only skilled and trained technicians should attempt at installing and servicing these units.



CAUTION:

Improper handling and operating procedures might adversely affect the proper functioning of the unit. Please read carefully this manual before operating the unit.

INSTALLATION PROCEDURES

A. Location of units

The Indoor FCU should be ideally located in a floor or hung to a wall that is near to the conditioned area where the access to the chilled water piping connection is easy.

Position the FCU in a way to avoid obstruction to return airflow, supply air, electrical cable connections, condensate drain pipe and chilled water piping.

B. Site Preparation

The site for the FCU installation should be free from any obstacle that can be hazardous to the installation personnel and/or damaging to the unit.

Properly identify all existing building utilities (such as electrical cables, plumbing pipes, sanitary hardware, etc.).

Make sure that live electrical cables are not hanging or running near the FCU proposed location or obstructing in any way the movement of the installation personnel.

Clear the floor from all objects with sharp edges.

Remove liquid or slippery material from the installation site before proceeding.

C. Indoor unit installation

Unit can be installed on the floor or mounted on the wall.

After unpacking the unit, cut the rear carton panel and mark it with a sketch simulating the FCU. Use it as a template for positioning the unit and marking the corresponding mounting slots to the wall.

- Put the template against the wall and mark the corners. Make sure that you leave sufficient space/clearance for unit maintenance, chilled water piping and control valve connections.
- Transfer the mark from the template to the wall as shown in figure-1.
- Drill 4 holes if the unit is to be mounted on the wall. Make only 2 holes (top and each side) for floor mounted units.
- After drilling the holes, insert wall plugs into the holes and install suitable screws with washers as shown in figure-2.
- Lift the unit and engage the screws in the slots (figure-3).
- Tighten the screws.

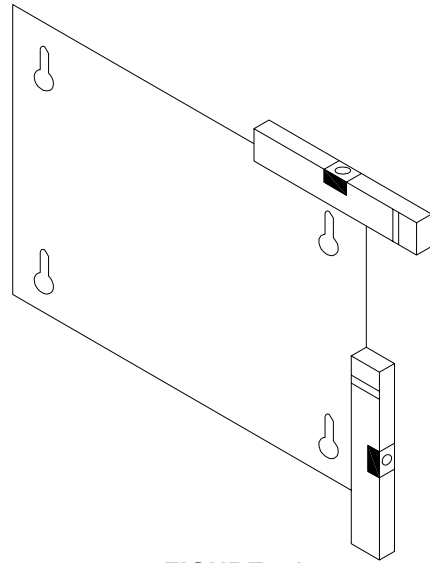


FIGURE - 1

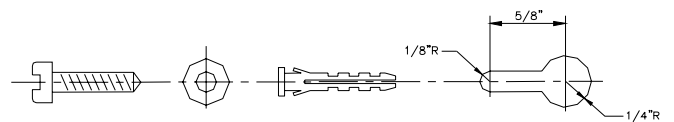


FIGURE - 2

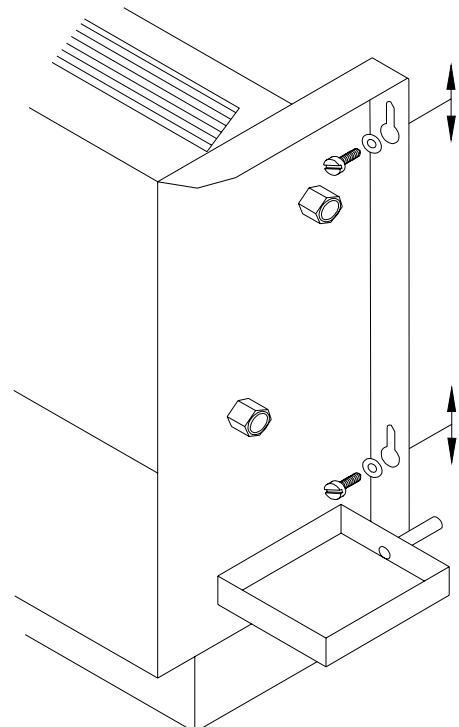


FIGURE - 3

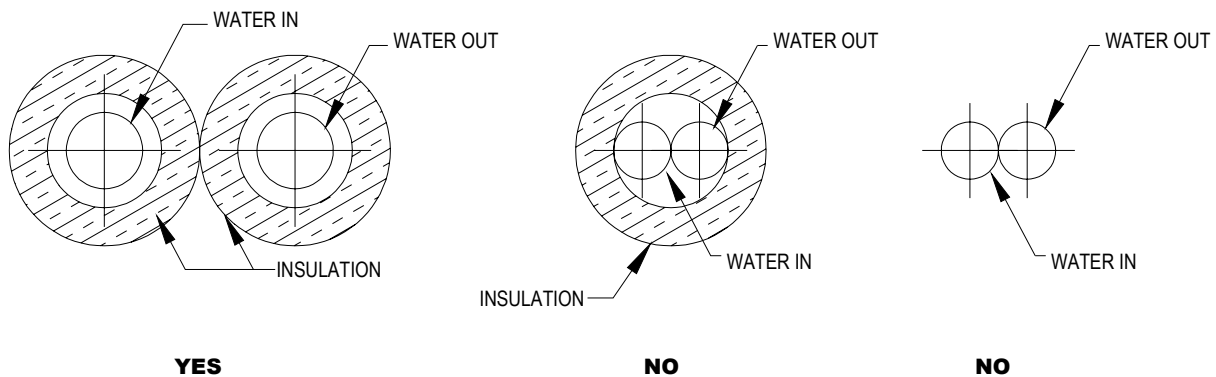
D. Piping connection

MODEL NUMBER	SWEAT CONNECTION	
	WATER INLET	WATER OUTLET
VWL 03	5/8"	5/8"
VWL 04	5/8"	5/8"
VWL 06	5/8"	5/8"
VWL 08	5/8"	5/8"
VWL 10	5/8"	5/8"

Note: The water lines must be installed level in both the horizontal & vertical plane.

Insulation of pipes

The pipe insulation should cover both inlet & outlet pipes as shown below.



E. Condensate Drain connection

- Use PVC Class 3 material for the condensate drain piping (3/4").
- Provide a "P" trap immediately at the condensate drain connection.
- Run your piping avoiding bends and elbows.
- Pitch the piping away from the unit with 2/100 slope.
- If the pipe is routed through a room (or an unconditioned space) insulate to avoid condensation on its outer walls.

F. Electrical connection

Please ensure power supply (V-Ph-Hz) to the unit is as per unit nameplate requirements.

Caution: Operation of the unit on improper power supply will result in damage to the unit.

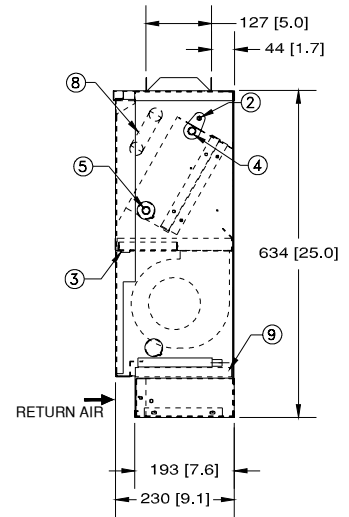
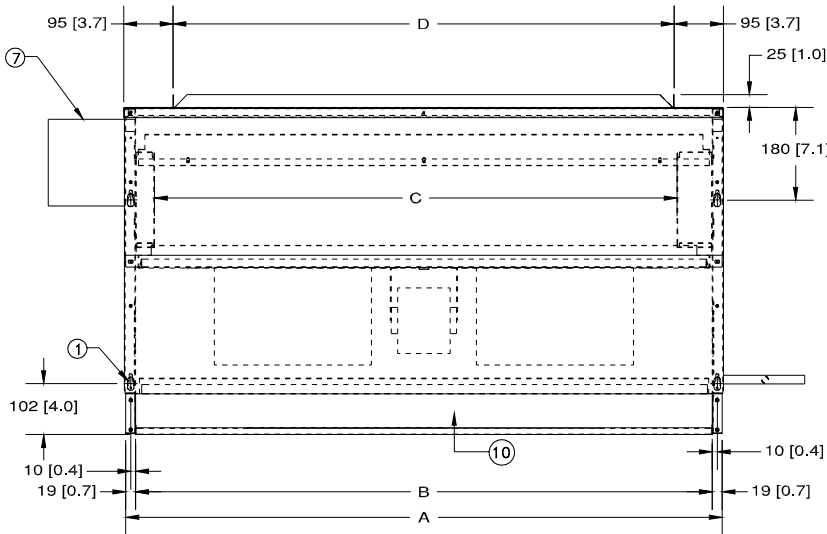
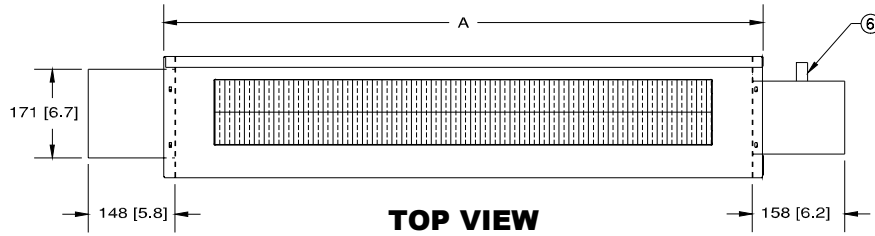
Warning: Before installation or servicing, always TURN OFF all power to the unit. There may be more than one disconnect switch. Ensure all of them are turned off.

Ground & Power wires

Connect power wires as per wiring diagram. Connect ground wire to the ground lug inside the control box.

UNIT DIMENSIONS

MODELS: VWL03 - VWL10



FRONT VIEW

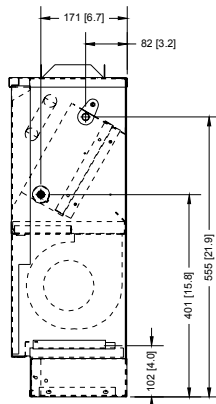
END VIEW

NOTE: All dimensions are in mm (dimensions in brackets are in inches).

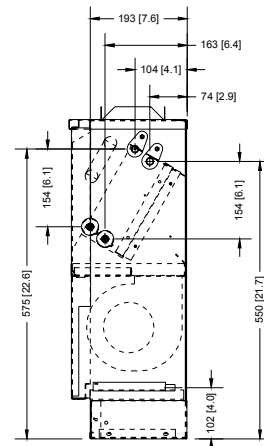
MODEL	DIMENSIONS				No. OF MOTORS	No. OF BLOWERS
	A	B	C	D		
VWL03	597 (23.5)	559 (22)	457 (18)	406 (16)	1	1
VWL04	851 (33.5)	813 (32)	711 (28)	660 (26)	1	2
VWL06	1105 (43.5)	1067 (42)	965 (38)	914 (36)	1	2
VWL08	1511 (59.5)	1473 (58)	1372 (54)	1321 (52)	2	4
VWL10	1715 (67.5)	1676 (66)	1575 (62)	1524 (60)	2	4

1. Mounting holes (4 No.)
2. Air vent
3. Drain pan
4. 5/8" OD coil outlet
5. 5/8" OD coil inlet
6. 7/8" OD drain
7. Control box
8. Heater
9. Filter
10. Return air

COIL CONNECTION DIMENSIONS



CHILLED WATER



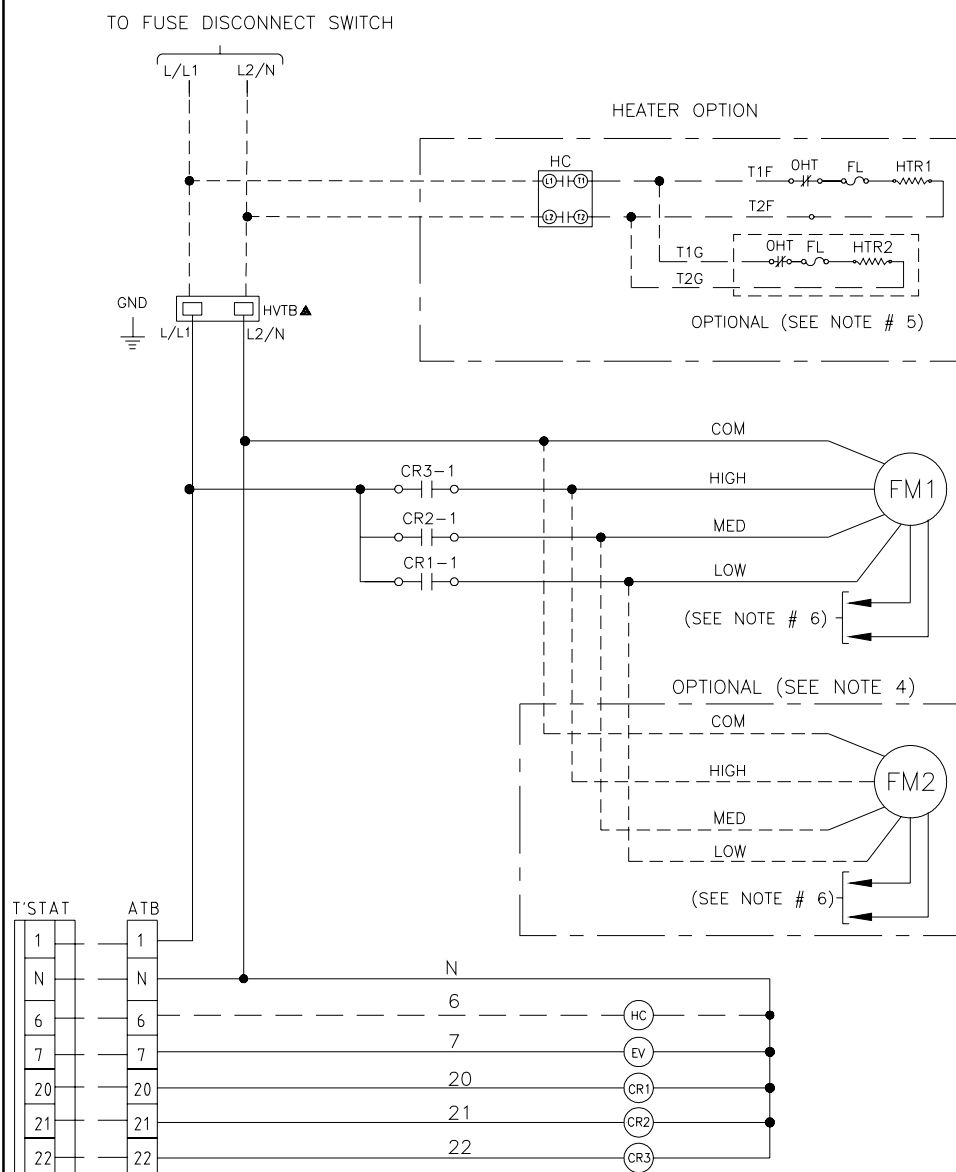
CHILLED WATER & HOT WATER

- INLET
- OUTLET

NOTE: All dimensions are in mm (dimensions in brackets are in inches).

TYPICAL SCHEMATIC WIRING DIAGRAM

HEAT/COOL MODELS - ELECTRIC HEATER



LEGEND	
ATB	AUXILIARY TERMINAL BLOCK
COM	COMMON
CR	CONTROL RELAY
EV	ELECTRIC VALVE (COOLING)
FL	FUSE LINK
FM	FAN MOTOR
GND	LUG GROUND
HC	HEATER CONTACTOR
HTR	HEATER
HVTB	HIGH VOLTAGE TERMINAL BLOCK
LL1	LINE OR LINE 1
L2N	LINE 2 OR NEUTRAL
OHT	OVER HEAT THERMOSTAT
---	FIELD WIRING
—	FACTORY WIRING

NOTES

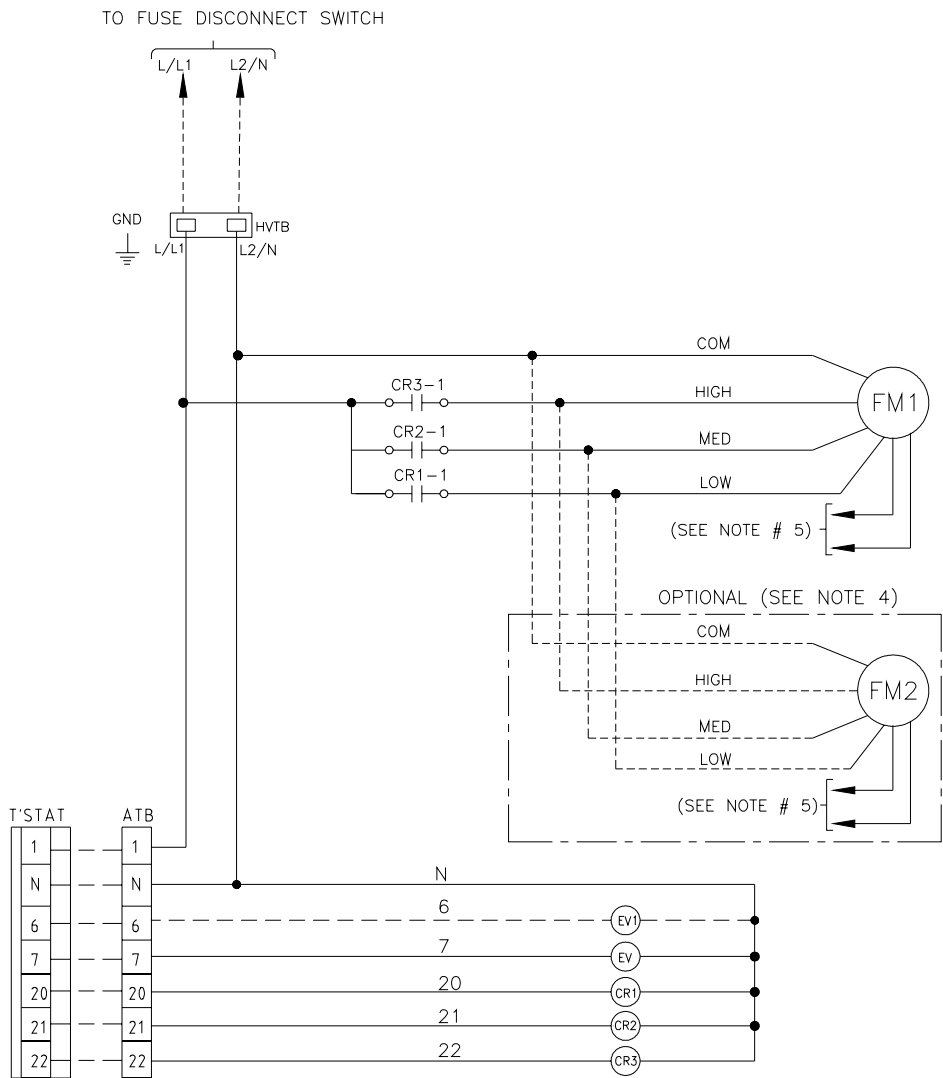
1. POWER SUPPLY, 220/240V-1PH-50Hz.
2. USE COPPER CONDUCTOR WIRES ONLY.
3. USE HEATER AS PER OPTION REQUIRED. IF HEATERS ARE FACTORY INSTALLED, PLEASE READ BROKEN LINES AS CONTINUOUS LINES.
4. FM2 NOT REQUIRED FOR SINGLE MOTOR AHU. IF FM2 IS FACTORY INSTALLED, PLEASE READ BROKEN LINES AS CONTINUOUS LINES.
5. HEATER 2 IS NOT REQUIRED FOR SINGLE HEATER CIRCUIT.
6. FREE END OF FAN MOTOR LEADS TO BE CAPPED WITH CRIMPABLE WIRE NUT.
7. HVTB NOT REQUIRED FOR HEATER MODELS.
8. MOTOR THERMALLY PROTECTED..
9. FUSED DISCONNECT SWITCH OR CIRCUIT BREAKER TO BE PROVIDED BY CONSUMER WITH RATING AS RECOMMENDED BY MANUFACTURER.

FACTORY WIRED MOTOR LEADS

MODEL	(WHT)	(BLK)	(YEL)	(BLU)	(ORN)	(RED)	APPLICABLE FREQUENCY IN HZ
VWL 03	COM	HIGH		MED		LOW	50
VWL 04	COM	HIGH		MED		LOW	50
VWL 06	COM	HIGH		MED		LOW	50
VWL 08	COM	HIGH		MED		LOW	50
VWL 10	COM	HIGH		MED		LOW	50

TYPICAL SCHEMATIC WIRING DIAGRAM

HEAT/COOL MODELS - HOT WATER



LEGEND	
ATB	AUXILIARY TERMINAL BLOCK
COM	COMMON
CR	CONTROL RELAY
EV	ELECTRIC VALVE (COOLING)
EV1	ELECTRIC VALVE (HEATING)
FM	FAN MOTOR
GND	LUG GROUND
HVTB	HIGH VOLTAGE TERMINAL BLOCK
LL1	LINE OR LINE 1
L2/N	LINE 2 OR NEUTRAL
---	FIELD WIRING
---	FACTORY WIRING

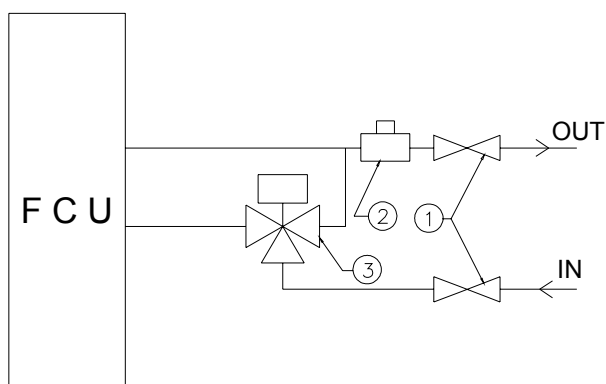
NOTES

1. POWER SUPPLY, 220/240V-1PH-50Hz.
2. USE COPPER CONDUCTOR WIRES ONLY.
3. IF EV1 IS FACTORY INSTALLED, PLEASE READ BROKEN LINES AS CONTINUOUS LINES.
4. FM2 NOT REQUIRED FOR SINGLE MOTOR AHU. IF FM2 IS FACTORY INSTALLED, PLEASE READ BROKEN LINES AS CONTINUOUS LINES.
5. FREE END OF FAN MOTOR LEADS TO BE CAPPED WITH CRIMPABLE WIRE NUT.
6. MOTOR THERMALLY PROTECTED..
7. FUSED DISCONNECT SWITCH OR CIRCUIT BREAKER TO BE PROVIDED BY CONSUMER WITH RATING AS RECOMMENDED BY MANUFACTURER.

FACTORY WIRED MOTOR LEADS						
MODEL	(WHT)	(BLK)	(YEL)	(BLU)	(ORN)	(RED)
VWL 03	COM	HIGH		MED		LOW
VWL 04	COM	HIGH		MED		LOW
VWL 06	COM	HIGH		MED		LOW
VWL 08	COM	HIGH		MED		LOW
VWL 10	COM	HIGH		MED		LOW

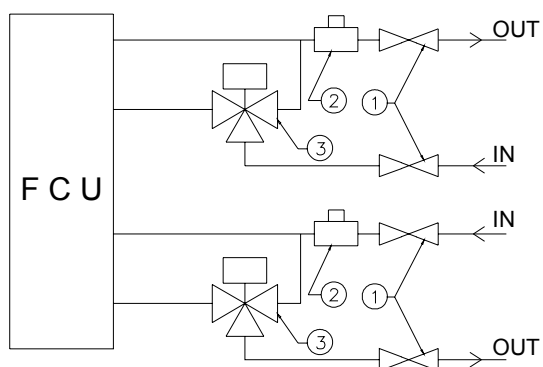
VALVE PACKAGES

VALVE PACKAGE 3-D (COOL ONLY)



- ① Two gate shut off valves
- ② One balancing valve
- ③ One 3-way motor valve

VALVE PACKAGE 4-D (COOL & HEAT)



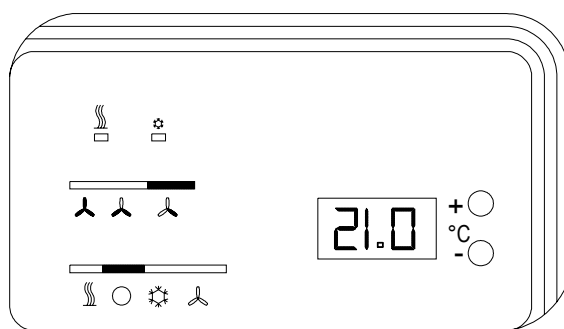
- ① Four gate shut off valves
- ② Two balancing valves
- ③ Two 3-way motor valves

PARTS LIST

DESCRIPTION	MODEL NUMBER				
	VWL03	VWL04	VWL06	VWL08	VWL10
BLOWER WHEEL	800-707-58	800-707-57 & 58	800-707-57 & 58	800-707-57 & 58	800-707-57 & 58
BLOWER MOTOR	800-827-17	800-827-08	800-827-11	800-827-08	800-827-11
RETURN AIR FILTER	800-248-20	800-248-22	800-248-23	800-248-25	800-248-26
VALVE PACKAGE (3D), COOL ONLY	700-361-62	700-361-62	700-361-62	700-361-62	700-361-62
THERMOSTAT	800-646-20	800-646-20	800-646-20	800-646-20	800-646-20

NOTE: For 4D type valve package, order 2 x 3D valve packages.

THERMOSTAT OPERATION & SPECIFICATION DATA



OPERATING INSTRUCTIONS

SYMBOL	FUNCTION
	OFF mode switch position
	COOL mode switch position
	FAN mode switch position
	HEAT mode switch position
	Temperature set button (increasing)
	Temperature set button (decreasing)
	LOW fan speed switch position
	MEDIUM fan speed switch position
	HIGH fan speed switch position

OPERATING PROCEDURE

SWITCH POSITION	FUNCTION
	COOLING MODE - Position the switch S1 to COOL mode function. - Set desired temperature setting by pressing the (+) or (-) button to increase or decrease the set value displayed on the LCD of the thermostat. - Fan speeds can be selected by positioning the switch S2 to: - LOW speed - MEDIUM speed - HIGH speed
	HEATING MODE - Position the switch S1 to HEAT mode function. - Set desired temperature setting by pressing the (+) or (-) button to increase or decrease the set value displayed on the LCD of the thermostat. - Fan speeds can be selected by positioning the switch S2 to: - LOW speed - MEDIUM speed - HIGH speed
	FAN MODE - Position the switch S1 to FAN mode function. - Fan speeds can be selected by positioning the switch S2 to: - LOW speed - MEDIUM speed - HIGH speed
	UNIT OFF - Position the switch S1 to OFF position to turn off the unit.

Notes:

1. Start-up display: When power is supplied to the thermostat, the LCD indicates a flashing display of the standard set point value. Press the (+) & (-) button at the same time to change the display to ambient temperature.
2. Set point adjustment: When the (+) or (-) button is pressed, the thermostat assumes the temperature set point setting mode and the present set point is displayed. The displayed set point can now be adjusted in 0.5K steps to the required value. After 3 seconds (approx.) the actual temperature will then be displayed.

PRODUCT DATA

Part Number : 800-646-20
Switches : Fan speed high/med/low
Heat/Fan/Cool/Off
Outputs : Heat
Cool
Fan speed high/med/low
Inputs : Remote sensor (optional)

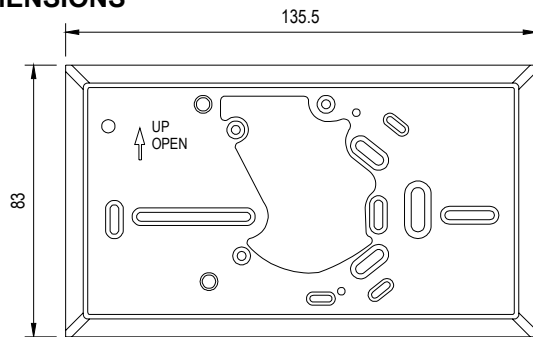
TECHNICAL DATA

Operating voltage : 230V + 10%; AC 50/60 Hz
Operating ambient : 0°C to 40°C
Temperature range : 5°C to 30°C
Selectivity of set value : 0.5K
Display range (actual value) : 0... + 40°C
Selectivity of actual value : 0.1K
Hysteresis : ~0.5K
Switching current at 250 VAC : 3 (2)A
Maximum fan current : 6 (3)A
Sensor system : NTC (in housing)
Optional Remote Sensor 193720
Switches : Heat/Off/Cool/Fan
3 Fan Speed
Indicator lamps : Cool/Heat

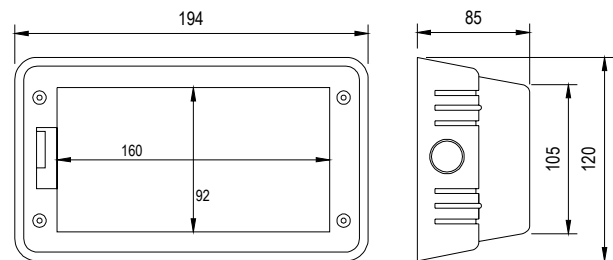
PHYSICAL DATA

Color : Polar white
Material : ABS plastic
Protection class : IP30 Plastic
Weight : 130 grams
Accessories : Base plate and screws
Option : Transparent wall mounted housing, lockable with ventilation slit.

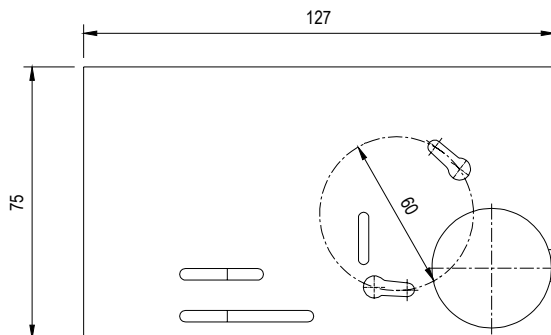
DIMENSIONS



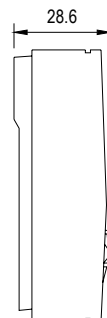
BASE PLATE



HOUSING PROTECTION (OPTIONAL)



THERMOSTAT



NOTE: All dimensions are in mm.

MAINTENANCE



Warning: Before you attend to any routine maintenance, make sure that the electrical power is disconnected.

- Avoid spilling any liquid on the thermostat
- Always allow for 1 to 2 minutes before activating different commands.

COIL CLEANING

Coil may be cleaned by removing and brushing between fins with a stiff wire brush. Brushing should be followed by cleaning with vacuum cleaner. The coil may also be cleaned by using a high pressure air, if compressed air source is available. It should be pointed out that if air filters are used and periodically cleaned, the coils will not be clogged up prematurely.

DRAIN PIPE

Drain pipe should be checked before summer operation of unit. If it is clogged, steps should be taken to clear the debris so that condensate will flow out easily. A standard pipe cleaner for 1/2" ID pipe may be used. Periodic checks of the drain pipe should be taken during summer operation, as there is a possibility of it becoming clogged with dirt.

FILTER CLEANING

Remove access panel, slide filter out of filter rack, and clean as follows:

Tap filter on solid surface to dislodge heavy particles. Wash under stream of hot water. If filter has been put to exceptional service, a mild solution of Sal-Soda, Tri-Sodium Phosphate or any other commercial solvent can be used. Set filter on end with slots in frame down, which allows it to drain. Filters should dry thoroughly before reuse.

REPLACEMENT PARTS

When writing for replacement parts, refer to model number and serial number on the nameplate of the unit.

ROUTINE/PREVENTIVE MAINTENANCE

- Clean the thermostat box with a dry soft cloth.
- Remove the filter by a jet of air in the reverse return air direction.
- Inspect the condensate pipe for clogging.